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PATENT  
134692

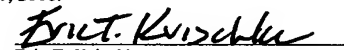
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent No.: 7,254,259  
Issued: August 7, 2007  
Inventor(s): Hsieh et al.  
Assignee: GE Medical Systems Global  
Technology Company, LLC  
For: METHODS AND APPARATUS FOR  
TRUNCATION COMPENSATION

Certificate  
APR 22 2008  
of Correction

CERTIFICATE OF MAILING

I certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on April 11, 2008.

  
Eric T. Krischke  
Reg. No. 42,769

Attention Certificate of Corrections Branch  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

REQUEST FOR CERTIFICATE OF CORRECTION OF  
PATENT UNDER 37 C.F.R. 1.322(a)

Sir:

Attached is Form PTO/SB/44 suitable for printing.

Submitted herewith is a copy of the Notice of Allowance and Fee(s) Due and the Notice of Allowability dated March 29, 2007 and a copy of the Preliminary Amendment filed November 5, 2003. Applicants respectfully submit that the corrections shown below are in accordance with the Preliminary Amendment filed November 5, 2003. The corrections thereof do not involve such changes in the patent as would constitute new matter or would require re-examination. Applicants respectfully request a Certificate of Correction for the following:

In Claim 10, column 11, line 48, delete "where p<sub>1</sub>(k), and" and insert therefor -- where p<sub>1</sub>(k), and --.

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PATENT  
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In Claim 27, column 14, line 18, after "greater than" insert -- t; --.

The corrections are not due to any error by Applicants and no fee is due.

The Assignment for this patent is recorded on Reel 014403/Frame 0205.

Respectfully submitted,

Date: April 11, 2008

Eric T. Krischke

Eric T. Krischke

Reg. No. 42,769

ARMSTRONG TEASDALE LLP

One Metropolitan Square, Suite 2600

St. Louis, Missouri 63102-2740

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## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO. : 7,254,259  
APPLICATION NO. : 10/615,411  
ISSUE DATE : August 7, 2007  
INVENTOR(S) : Hsieh et al.

PAGE 1 OF 1

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In Claim 10, column 11, line 48, delete "where  $p_1(k)$ , and" and insert therefor -- where  $p_i(k)$ , and --.

In Claim 27, column 14, line 18, after "greater than" insert --  $t$ ; --.

**MAILING ADDRESS OF SENDER:**

Eric T. Krischke  
Armstrong Teasdale LLP  
One Metropolitan Sq., Suite 2600  
St. Louis, MO 63102

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**COPY**

THE UNITED STATES PATENT OFFICE IS REQUESTED TO IMPRESS ITS STAMP ON THIS CARD AND PLACE SAME IN THE OUTGOING MAIL TO SHOW THE FOLLOWING PAPERS HAVE BEEN RECEIVED.

Atty Dkt. No.: 134692 (12553-371)

Application of: Jiang Hsieh et al.

Serial No. 10/615,411

Filed: July 3, 2003

Art Unit: 2124

For: **METHODS AND APPARATUS FOR TRUNCATION  
COMPENSATION**

Enclosed:

Amendment Transmittal form with Express Mail Certification (3 pgs.),  
in duplicate

Preliminary Amendment (11 pgs.)

Express Mail No. EV 298648424 US

TMF/lav

Mailed: November 5, 2003

**EV298648424US**

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PATENT  
134692

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Jiang Hsieh et al. :  
Serial No.: 10/615,411 : Art Unit: 2124  
Filed: July 3, 2003 : Examiner: Not yet assigned  
For: METHODS AND APPARATUS :  
FOR TRUNCATION :  
COMPENSATION :

Mail Stop: Non-Fee Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**TRANSMITTAL**

1. Transmitted herewith are:

Preliminary Amendment (11 pgs.)  
Return Postcard

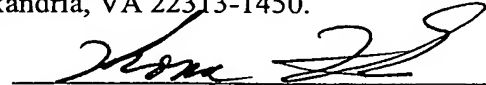
**STATUS**

2. Applicant  
☐ claims small entity status.  
☒ is other than a small entity.

**CERTIFICATE OF MAILING BY EXPRESS MAIL TO  
THE COMMISSIONER FOR PATENTS**

Express Mail No.: EV 298648424 US  
Date: November 5, 2003

I hereby certify that the documents listed above are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. §1.10 on the date indicated above in an envelope addressed to: Mail Stop: Non-Fee Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

  
Thomas M. Fisher  
Registration No. 47,564

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# EXTENSION OF TERM

3. The proceedings herein are for a patent application and the provisions of 37 C.F.R. 1.136 apply.

(complete (a) or (b), as applicable)

- (a) ☐ Applicant petitions for an extension of time under 37 C.F.R. 1.136  
(Fees: 37 C.F.R. 1.17(a)-(d) for the total number of months checked below:)

Extension for response within:	Other than small entity Fee	Small entity Fee (if applicable)
<input type="checkbox"/> first month	\$ 110.00	\$ 55.00
<input type="checkbox"/> Second month	\$ 420.00	\$ 210.00
<input type="checkbox"/> third month	\$ 950.00	\$ 475.00
<input type="checkbox"/> Fourth month	\$1,480.00	\$ 740.00
<input type="checkbox"/> fifth month	\$ 2,010.00	\$1,005.00

Fee Due \$ \_\_\_\_\_

If an additional extension of time is required, please consider this a petition therefor.

(Check and complete the next item, if applicable)

- ☐ An extension of \_\_\_\_\_ months has already been secured. The fee paid therefor \$\_\_\_\_\_ is deducted from the total fee due for the total months of extension now requested.

Extension fee due with this request \$ \_\_\_\_\_.

OR

- (b) ☒ Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition for extension of time.

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**FEE FOR CLAIMS**

4. The fee for claims (37 C.F.R. 1.16(b)-(d)) has been calculated as shown below:

	(Col. 1) CLAIMS REMAINING AFTER AMENDMENT		(Col. 2) HIGHEST NO. PREVIOUSLY PAID FOR	(Col. 3) PRESENT EXTRA	SMALL ENTITY ADDITIONAL RATE FEE	OR	OTHER THAN SMALL ENTITY ADDITIONAL RATE FEE
TOTAL		MINUS		=	x \$9 = \$		x \$18 = \$
INDEP.		MINUS		=	x \$43 = \$		x \$86 = \$
— FIRST PRESENTATION OF MULTIPLE DEP. CLAIM					+ \$145 = \$		+ \$290 = \$
					TOTAL ADDITIONAL FEE \$	OR	TOTAL ADDITIONAL FEE \$

- (a) ☒ No additional fee for Claims is required

OR

- (b) ☐ Total additional fee for claims required \$

**FEE PAYMENT**


5.        Attached is a check in the sum of \$            
☐ Charge Deposit Account No. 01-2384 the sum of \$      .  
 A duplicate of this transmittal is attached.

**FEE DEFICIENCY**

6. ☒ If any additional extension and/or fee is required, charge Deposit Account No. 01-2384.

AND/OR

- ☒ If any additional fee for claims is required, charge Deposit Account No. 01-2384.  
 7. ☐ Other:

  
 Thomas M. Fisher  
 Registration No. 47,564  
 ARMSTRONG TEASDALE LLP  
 One Metropolitan Square, Suite 2600  
 St. Louis, MO 63102  
 314-621-5070

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**COPY**

Docket No. 134692

Express Mail No. EV 298648424 US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Jiang Hsieh et al.	:	
	:	Art Unit: 2124
Serial No.: 10/615,411	:	
	:	Examiner:
Filed: July 3, 2003	:	
	:	
For: METHODS AND APPARATUS	:	
FOR TRUNCATION	:	
COMPENSATION	:	

**PRELIMINARY AMENDMENT**

Mail Stop: Non-Fee Amendment  
Hon. Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Applicants hereby request entry of the following amendment prior to examination  
of the above-referenced application:



Docket No. 134692

Express Mail No. EV 298648424 US

## IN THE CLAIMS

1. (original) A method for determining whether a projection is truncated, said method comprising:

calculating a sum of all samples at each projection view of a scan of an object;

determining a maximum value of the calculated sums;

averaging a plurality of samples  $m$  at a projection view index  $k$  when the sum of all samples at index  $k$  is less than a predetermined percentage of the maximum value;

comparing the average to a threshold  $t$ ;

determining the projection truncated when the average is greater than  $t$ ;  
and

determining the projection not truncated when the average is not greater than  $t$ .

2. (original) A method in accordance with Claim 1 further comprising augmenting partially sampled field of view data using fully sampled field of view data when the projection is determined truncated.

3. (original) A method in accordance with Claim 1 wherein said comparing the average to a threshold  $t$  comprises comparing the average to a threshold  $t$ , wherein  $t$  is between about .25 and about .58.

4. (original) A method in accordance with Claim 3 wherein said comparing the average to a threshold  $t$  comprises comparing the average to a threshold  $t$ , wherein  $t$  is between about .33 and about .5.

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5. (original) A method in accordance with Claim 4 wherein said comparing the average to a threshold  $t$  comprises comparing the average to a threshold  $t$ , wherein  $t$  is between about .375 and about .46.

6. (original) A method in accordance with Claim 5 wherein said comparing the average to a threshold  $t$  comprises comparing the average to a threshold  $t$ , wherein  $t$  is about .42.

7. (original) A method in accordance with Claim 1 further comprising estimating a total attenuation  $\tau(k)$  using a plurality of projection views.

8. (original) A method in accordance with Claim 7 wherein said estimating a total attenuation  $\tau(k)$  using a plurality of projection views comprises estimating a total attenuation  $\tau(k)$  in accordance with:

$$\tau(k) = \frac{k_2 - k}{k_2 - k_1} \xi(k_1) + \frac{k - k_1}{k_2 - k_1} \xi(k_2)$$

where  $k_1$  and  $k_2$  are view locations of un-truncated views adjacent to a truncation region comprising at least one projection determined truncated, and  $\xi(k)$  is calculated as

$$\xi(k) = \sum_{i=1}^N p(i, k).$$

9. (original) A method in accordance with Claim 8 further comprising determining an attenuation difference  $\lambda(k)$  in accordance with  $\lambda(k) = \tau(k) - \xi(k)$ .

10. (original) A method in accordance with Claim 9 further comprising:

calculating an amount of attenuation to add  $\eta(k)$  in accordance with

$$\eta(k) = \frac{\pi}{2} R_l^2(k) - x_l(k) p_l(k) - R_l^2(k) \arcsin\left(\frac{x_l(k)}{R_l(k)}\right) + \frac{\pi}{2} R_r^2(k) - x_r(k) p_r(k) - R_r^2(k) \arcsin\left(\frac{x_r(k)}{R_r(k)}\right) \text{ wh}$$

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ere  $p_l(k)$ , and  $p_r(k)$ , are the magnitude of a left and a right projection boundary samples averaged over multiple views, respectively, and  $x_l(k)$ ,  $x_r(k)$ ,  $R_l(k)$ , and  $R_r(k)$  are a location and radius of a left and right fitted cylinders, respectfully; and

comparing  $\eta(k)$  to  $\lambda(k)$ .

11. (original) A method in accordance with Claim 10 wherein said comparing  $\eta(k)$  to  $\lambda(k)$  comprises calculating a ratio  $\varepsilon(k) = \frac{\eta(k)\mu_w}{\lambda(k)}$  where  $\mu_w$  is an attenuation coefficient of water, said method further comprising:

comparing  $\varepsilon(k)$  to a threshold  $q$ ; and

using at least one of  $\eta(k)$  and  $\lambda(k)$  to correct an image when  $\varepsilon(k)$  is not greater than  $q$ ; and

not using either of  $\eta(k)$  and  $\lambda(k)$  to correct an image when  $\varepsilon(k)$  is greater than  $q$ .

12. (original) A method in accordance with Claim 11 wherein said comparing  $\varepsilon(k)$  to a threshold  $q$  comprises comparing  $\varepsilon(k)$  to a threshold  $q$ , wherein  $q$  is between about 1.5 and about 2.5.

13. (original) A method in accordance with Claim 11 wherein said comparing  $\varepsilon(k)$  to a threshold  $q$  comprises comparing  $\varepsilon(k)$  to a threshold  $q$ , wherein  $q$  is between about 1.75 and about 2.25.

14. (original) A method in accordance with Claim 11 wherein said comparing  $\varepsilon(k)$  to a threshold  $q$  comprises comparing  $\varepsilon(k)$  to a threshold  $q$ , wherein  $q$  is between about 1.9 and about 2.1.

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15. (original) A method in accordance with Claim 11 wherein said comparing  $\epsilon(k)$  to a threshold  $q$  comprises comparing  $\epsilon(k)$  to a threshold  $q$ , wherein  $q$  is about 2.

16. (original) A method in accordance with Claim 11 wherein said using at least one of  $\eta(k)$  and  $\lambda(k)$  to correct an image when  $\epsilon(k)$  is not greater than  $q$  comprises using  $\eta(k)$  to correct an image when  $\epsilon(k)$  is not greater than  $q$ .

17. (original) A method in accordance with Claim 11 wherein said not using either of  $\eta(k)$  and  $\lambda(k)$  to correct an image when  $\epsilon(k)$  is greater than  $q$  comprises:

calculating a  $\eta_n(k)$  based on data regarding a  $k_1-n$  view and a  $k_2+n$  view, wherein  $n$  is an integer;

and correcting an image using the  $\eta_n(k)$ .

18. (original) A method in accordance with Claim 17, wherein  $n$  is between 2 and 8 inclusive.

19. (original) A method in accordance with Claim 17, wherein  $n$  is between 3 and 7 inclusive.

20. (original) A method in accordance with Claim 17, wherein  $n$  is 5.

21. (original) A method in accordance with Claim 7 wherein said estimating a total attenuation  $\tau(k)$  using a plurality of projection views comprises estimating a total attenuation  $\tau(k)$  in accordance with:

$$\tau(k) = \frac{k_2 - k}{k_2 - k_1} \xi(k_1) + \frac{k - k_1}{k_2 - k_1} \xi(k_2)$$

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where  $k_1$  and  $k_2$  are averages of a plurality of view locations of un-truncated views adjacent to a truncation region comprising at least one projection

determined truncated, and  $\xi(k)$  is calculated as  $\xi(k) = \sum_{i=1}^N p(i, k)$ .

22. (currently amended) An imaging apparatus comprising:

a radiation source;

a detector responsive to radiation positioned to receive radiation emitted from said source; and

a computer operationally coupled to said radiation source and said detector, said computer configured to:

~~calculating~~ calculate a sum of all samples at each projection view of a scan of an object;

~~determining~~ determine a maximum value of the calculated sums;

~~averaging~~ average a plurality of samples  $m$  at a projection view index  $k$  when the sum of all samples at index  $k$  is less than a predetermined percentage of the maximum value;

compare the average to a threshold  $t$ ;

determine the projection truncated when the average is greater than  $t$ ; and

determine the projection not truncated when the average is not greater than

t.

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23. (original) An apparatus in accordance with Claim 22 wherein said computer is further configured to compare the average to a threshold  $t$ , wherein  $t$  is between about .25 and about .58.

24. (original) An apparatus in accordance with Claim 22 wherein said computer is further configured to estimate a total attenuation  $\tau(k)$  in accordance with:

$$\tau(k) = \frac{k_2 - k}{k_2 - k_1} \xi(k_1) + \frac{k - k_1}{k_2 - k_1} \xi(k_2)$$

where  $k_1$  and  $k_2$  are view locations of un-truncated views adjacent to a truncation region comprising at least one projection determined truncated, and  $\xi(k)$  is

$$\text{calculated as } \xi(k) = \sum_{i=1}^N p(i, k).$$

25. (original) An apparatus in accordance with Claim 22 wherein said computer is further configured to estimate a total attenuation  $\tau(k)$  in accordance with:

$$\tau(k) = \frac{k_2 - k}{k_2 - k_1} \xi(k_1) + \frac{k - k_1}{k_2 - k_1} \xi(k_2)$$

where  $k_1$  and  $k_2$  are averages of a plurality of view locations of un-truncated views adjacent to a truncation region comprising at least one projection

determined truncated, and  $\xi(k)$  is calculated as  $\xi(k) = \sum_{i=1}^N p(i, k).$

26. (original) An apparatus in accordance with Claim 25 wherein said computer is further configured to:

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determine a attenuation difference  $\lambda(k)$  in accordance with  
 $\lambda(k) = \tau(k) - \xi(k)$ ;

calculate an amount of attenuation to add  $\eta(k)$  in accordance with  
$$\eta(k) = \frac{\pi}{2} R_l^2(k) - x_l(k) p_l(k) - R_l^2(k) \arcsin\left(\frac{x_l(k)}{R_l(k)}\right) + \frac{\pi}{2} R_r^2(k) - x_r(k) p_r(k) - R_r^2(k) \arcsin\left(\frac{x_r(k)}{R_r(k)}\right)$$
 where  $p_l(k)$ , and  $p_r(k)$ , are the magnitude of a left and a right projection boundary samples averaged over multiple views, respectively, and  $x_l(k)$ ,  $x_r(k)$ ,  $R_l(k)$ , and  $R_r(k)$  are a location and radius of a left and right fitted cylinders, respectfully;

compare  $\eta(k)$  to  $\lambda(k)$  by calculating a ratio  $\varepsilon(k) = \frac{\eta(k)\mu_w}{\lambda(k)}$  where  $\mu_w$  is an attenuation coefficient of water;

compare  $\varepsilon(k)$  to a threshold  $q$ ;

use at least one of  $\eta(k)$  and  $\lambda(k)$  to correct an image when  $\varepsilon(k)$  is not greater than  $q$ ; and

when  $\varepsilon(k)$  is greater than  $q$ :

calculate a  $\eta_n(k)$  based on data regarding a  $k_1-n$  view and a  $k_2+n$  view, wherein  $n$  is an integer; and

correct an image using the  $\eta_n(k)$ .

27. (original) A computer readable medium encoded with a program configured to instruct a computer to:

calculate a sum of all samples at each projection view of a scan of an object;

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determine a maximum value of the calculated sums;

average a plurality of samples  $m$  at a projection view index  $k$  when the sum of all samples at index  $k$  is less than a predetermined percentage of the maximum value;

compare the average to a threshold  $t$ ;

determine the projection truncated when the average is greater than  $t$ ;

determine the projection not truncated when the average is not greater than  $t$ ;

estimate a total attenuation  $\tau(k)$  in accordance with

$$\tau(k) = \frac{k_2 - k}{k_2 - k_1} \xi(k_1) + \frac{k - k_1}{k_2 - k_1} \xi(k_2)$$

where  $k_1$  and  $k_2$  are averages of a plurality of view locations of un-truncated views adjacent to a truncation region comprising at least one projection

determined truncated, and  $\xi(k)$  is calculated as  $\xi(k) = \sum_{i=1}^N p(i, k)$ ;

determine a attenuation difference  $\lambda(k)$  in accordance with  $\lambda(k) = \tau(k) - \xi(k)$ ;

calculate an amount of attenuation to add  $\eta(k)$  in accordance with

$$\eta(k) = \frac{\pi}{2} R_l^2(k) - x_l(k) p_l(k) - R_l^2(k) \arcsin\left(\frac{x_l(k)}{R_l(k)}\right) + \frac{\pi}{2} R_r^2(k) - x_r(k) p_r(k) - R_r^2(k) \arcsin\left(\frac{x_r(k)}{R_r(k)}\right) \text{ wh}$$

ere  $p_l(k)$ , and  $p_r(k)$ , are the magnitude of a left and a right projection boundary samples

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averaged over multiple views, respectively, and  $x_l(k)$ ,  $x_r(k)$ ,  $R_l(k)$ , and  $R_r(k)$  are a location and radius of a left and right fitted cylinders, respectfully;

compare  $\eta(k)$  to  $\lambda(k)$  by calculating a ratio  $\varepsilon(k) = \frac{\eta(k)\mu_w}{\lambda(k)}$  where  $\mu_w$  is an attenuation coefficient of water,

compare  $\varepsilon(k)$  to a threshold  $q$ ;

use at least one of  $\eta(k)$  and  $\lambda(k)$  to correct an image when  $\varepsilon(k)$  is not greater than  $q$ ; and

when  $\varepsilon(k)$  is greater than  $q$ :

calculate a  $\eta_n(k)$  based on data regarding a  $k_1-n$  view and a  $k_2+n$  view, wherein  $n$  is an integer; and

correct an image using the  $\eta_n(k)$ .

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Docket No. 134692

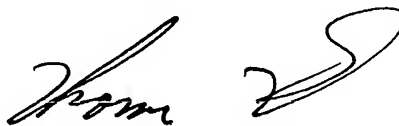
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**Remarks**

The claims have been amended to correct typographical errors. No new matter has been added.

Favorable action is respectfully solicited. Applicants believe that no fee is due for this preliminary amendment; however, if any fee is due, please charge the fee due to Deposit Account No. 01-2384.

Respectfully Submitted,



---

Thomas M. Fisher  
Registration No. 47,564  
ARMSTRONG TEASDALE LLP  
One Metropolitan Square, Suite 2600  
St. Louis, Missouri 63102-2740  
(314) 621-5070



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## UNITED STATES PATENT AND TRADEMARK OFFICE

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### NOTICE OF ALLOWANCE AND FEE(S) DUE

7590

03/29/2007

Patrick W. Rasche  
Armstrong Teasdale LLP  
Suite 2600  
One Metropolitan Square  
St. Louis, MO 63102

EXAMINER

BALI, VIKKRAM

ART UNIT

PAPER NUMBER

2624

DATE MAILED: 03/29/2007

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/615,411	07/03/2003	Jiang Hsich	134692	7955
TITLE OF INVENTION: METHODS AND APPARATUS FOR TRUNCATION COMPENSATION				

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1400	\$300	\$0	\$1700	06/29/2007

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

#### HOW TO REPLY TO THIS NOTICE:

##### I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER:** Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

Entered into PAGE P183

Date 04-03-07

Rv

SCANNED

By: 413107 VR

Date: 4/2/07

By: mcs

12553-371



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## PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** Mail Stop ISSUE FEE  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
or **Fax** (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

7590

03/29/2007

Patrick W. Rasche  
Armstrong Teasdale LLP  
Suite 2600  
One Metropolitan Square  
St. Louis, MO 63102

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

### Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/615,411	07/03/2003	Jiang Hsieh	134692	7955

TITLE OF INVENTION: METHODS AND APPARATUS FOR TRUNCATION COMPENSATION

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1400	\$300	\$0	\$1700	06/29/2007

EXAMINER	ART UNIT	CLASS-SUBCLASS
BALI, VIKKRAM	2624	382-131000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1	_____
2	_____
3	_____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee  
☐ Publication Fee (No small entity discount permitted)  
☐ Advance Order - # of Copies \_\_\_\_\_

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.  
☐ Payment by credit card. Form PTO-2038 is attached.  
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature \_\_\_\_\_

Date \_\_\_\_\_

Typed or printed name \_\_\_\_\_

Registration No. \_\_\_\_\_

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/615,411	07/03/2003	Jiang Hsieh	134692	7955
7590	03/29/2007			

Patrick W. Rasche  
Armstrong Teasdale LLP  
Suite 2600  
One Metropolitan Square  
St. Louis, MO 63102

EXAMINER	
BALI, VIKKRAM	
ART UNIT	PAPER NUMBER
2624	

DATE MAILED: 03/29/2007

**Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)**  
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 937 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 937 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

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## Notice of Allowability

Application No.

10/615,411

Examiner

Vikram Bali

Applicant(s)

HSIEH ET AL.

Art Unit

2624

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 1/23/2007.
2. ☒ The allowed claim(s) is/are 1-27.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

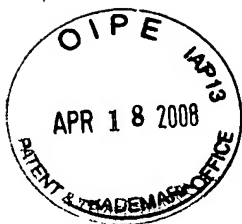
4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

### Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date 3/8/04
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

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Patent Publication

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Application/Control Number: 10/615,411  
Art Unit: 2624

Page 2

**DETAILED ACTION**  
**EXAMINER'S AMENDMENT**

In specification:

Paragraph [0003] line 7, delete "###/###,###" after "serial number" and insert --  
"10/602,565" -- after "serial number".

This amendment is done in order to update the specification.

***Allowable Subject Matter***

1. Claims 1-27 are allowed.
2. The following is an examiner's statement of reasons for allowance:

Claims 1-27 are allowed because prior art taken alone or in combination with fail to disclose, teach or suggest a method for determining whether a projection is truncated, that includes calculating a sum of all samples at each projection view of a scan of an object, determining a maximum value of the calculated sums, averaging a plurality of samples  $m$  at a projection view index  $k$  when the sum of all samples at index  $k$  is less than a predetermined percentage of the maximum value, comparing the average to a threshold  $t$ , and determining the projection truncated when the average is greater than  $t$ , determining the projection not truncated when the average is not greater than  $t$ .

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Patent Examination

APR 22 2008

Application/Control Number: 10/615,411  
Art Unit: 2624

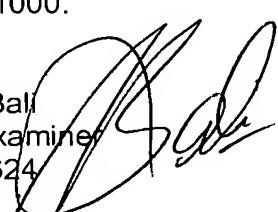
Page 3

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vikkram Bali whose telephone number is 571.272.7415. The examiner can normally be reached on 7:00 AM - 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eileen Lillis can be reached on 571.272.6928. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Vikkram Bali  
Primary Examiner  
Art Unit 2624



vb  
March 27, 2007

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PTO/SB/08A (08-00)

Approved for use through 10/31/2002. OMB 0651-0031

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Substitute for form 1449A/PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  <i>(use as many sheets as necessary)</i>		<b>Complete if Known</b>	
		Application Number	10/615,411
		Filing Date	July 3, 2003
		First Named Inventor	Jiang Hsieh
		Group Art Unit	2124
		Examiner Name	
Sheet	1	of	1
		Attorney Docket Number	134692

U.S. PATENT DOCUMENTS						
Examiner Initials*	Cite No. <sup>1</sup>	U.S. Patent Document		Name of Patentee or Applicant Of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number	Kind Code <sup>2</sup> (if known)			
/VB/	AA	6,307,909	B1	Flohr et al.	Oct. 23, 2001	
/VB/	AB	5,953,388		Walnut et al.	Sep. 14, 1999	
/VB/	AC	5,640,436		Kawai et al.	Jun. 17, 1997	
/VB/	AD	5,299,248		Pelc	Mar. 29, 1994	
/VB/	AE	5,276,614		Heuscher	Jan. 4, 1994	
/VB/	AF	5,043,890		King	Aug. 27, 1991	
/VB/	AG	4,878,169		Toner et al.	Oct. 31, 1989	
/VB/	AH	4,550,371		Glover et al.	Oct. 29, 1985	
/VB/	AI	4,446,521		Inouye	May 1, 1984	
/VB/	AJ	4,305,127		Heuscher	Dec. 8, 1981	
/VB/	AK	4,189,775		Inouye et al.	Feb. 19, 1980	
/VB/	AL	4,136,388		Lindquist	Jan. 23, 1979	
	AM					
	AN					
	AO					
	AP					
	AQ					
	AR					
	AS					
	AT					

FOREIGN PATENT DOCUMENTS								
Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document			Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>4</sup>
		Office <sup>3</sup>	Number <sup>4</sup>	Kind Code <sup>5</sup> (if known)				
	FA							
	FB							
	FC							
	FD							
	FE							
	FF							
	FG							

Examiner Signature	/Vikram Bali/	Date Considered:	03/23/2007
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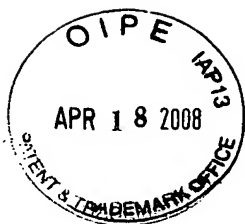
\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup>Unique citation designation number. <sup>2</sup>See Attached Kinds of U.S. Patent Documents. <sup>3</sup>Enter Office that issued the document, by the two-letter code (WSIPO Standard ST.3). <sup>4</sup>For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup>Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 18 if possible. <sup>6</sup>Applicant is to place a check mark here if English language translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, D.C. 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

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## Notice of References Cited

Application/Control No.

10/615,411

Applicant(s)/Patent Under  
Reexamination  
HSIEH ET AL.

Examiner

Vikram Bali

Art Unit

2624

Page 1 of 1

### U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,856,666	02-2005	Lonn et al.	378/8
*	B	US-6,549,646	04-2003	Yeh et al.	382/132
*	C	US-6,810,102	10-2004	Hsieh et al.	378/4
	D	US-			
	E	US-			
	F	US-			
	G	US-			
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	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
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	T					

### NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
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	X	

\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

APR 22 2008